UNIONS AND JOB QUEUING IN MEXICO'S MAQUILADORAS

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During the last two decades, cities along the United States-Mexico border have experienced substantially different employment and wage growth patterns. These growth differentials to a large extent can be traced to the location choice of the in-bond assembly plants (maquiladoras) that have become an integral part of the economic landscape of the region. From 1987 to 1997, maquiladora employment tripled to almost one million workers. Total employment grew at an annual rate of 11.26 percent. Nonetheless, this growth has been uneven. For example, while Tijuana's annual employment grew at an annual rate of 12.82 percent from 1987 to 1997, annual employment growth was only 6.66 percent in Matamoros [Otero, 1999]. Perhaps part of these observed differences could be related to heterogeneity in union power across border cities.

This paper assesses the degree of union strength (or power) in the maquiladora sector of the Mexican border cities of Matamoros, Nuevo Laredo, Ciudad Juárez and Tijuana. Union power has traditionally been measured by using union density data; that is, by estimating the percentage of workers in a given region or industry that belong to a union.[1] Our alternative measure is based on the idea that job queues are a clear signal of powerful labor unions regardless of the percentage of the workforce unionized.

Using data from Mexico's National Urban Employment Survey for 1998, we estimate job queuing models using the specification developed by Abowd and Farber [1982]. A version of their partial observability bivariate probit model is compared to a simple probit model of maquiladora employment. We find that job queuing is prevalent in the four cities studied. Queuing, however, is stronger in those border cities characterized by strong union leadership and low competition among unions, irrespective of union density. That is, queuing is stronger in Matamoros—a city where maquiladora employment is virtually monopolized by a single union boss—than in all other border cities. The main implication of these findings is that, when empirically assessing relative union strength, union competition and leader conduct in a given region are as important as union density.

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LABOR UNIONS AND MAQUILADORAS IN BORDER CITIES

Border cities in Northern Mexico have exhibited quite different labor market growth patterns over the last twenty years. Much of these differences in economic growth can be attributed to uneven maquiladora development along the U.S-Mexico border. It is possible that this uneven development can be partly attributed to differences in union strength across these cities.

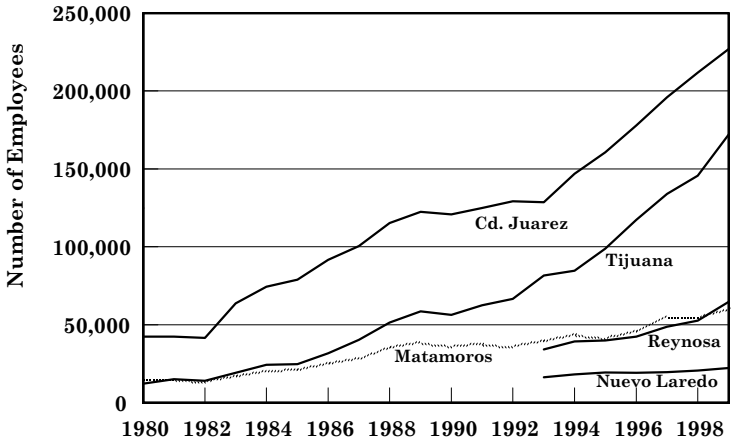
Labor Unions in the Maquiladoras

The maquiladora industry began in 1965 with the implementation of Mexico's Border Industrialization Program (BIP). The official intent of this economic development initiative was to combat the high unemployment in the border region resulting from the elimination in the United States of the "bracero" program in 1964.[2] The BIP program allowed the unrestricted entry of foreign capital into the border region, and government decrees enacted in March 1971 made the value added resulting from manufacturing in Mexico the only portion subject to taxation [Baerresen, 1971; Comercio Exterior, 1971; Hunt, 1970]. This legislation fueled substantial growth in the maquiladora industry and by 1986 Mexico accounted for more value added from in-bond processing plants than any other of the 63 countries using this model of industrialization [Otero, 1999]. Maquiladora employment has grown from 113,897 workers at the beginning of 1980 to 1.2 million at the end of 1999. Employment growth has been particularly strong in Tijuana, where employment grew from 12,299 workers in December 1980 to 168,461 workers in December 1999 (see Figure 1).

Labor organization in the maquiladoras is very heterogeneous with regard to the level of unionization, the number of labor unions in the region competing for the representation of laborers, and the "style" of unionism practiced by its leaders. In terms of union power, border cities can be grouped into two categories based solely on their level of unionization as a proportion of the labor force employed in the maquiladora industry. The cities of Matamoros (100 percent), Reynosa (100 percent), Nuevo Laredo (95 percent), and Piedras Negras (100 percent)[3] are characterized by the high proportion of the labor force that is unionized. On the other hand, all other border cities with a substantial maquiladora presence—particularly Ciudad Juárez (13 percent) and Tijuana (30 percent)—are characterized by low union density.

For the most part, union presence is the highest in the state of Tamaulipas. Although unionization is practically 100 percent in the largest urban areas of the state, union power differs considerably across cities; therefore, other factors besides union density most likely also affect union strength. If we consider the number of labor unions competing for a contract in a given city together with the style of unionism practiced by the leadership, we must separate Matamoros into a category of its own. In Matamoros, worker representation in maquiladoras has been dominated historically by a single union boss. Alternatively, in Reynosa and Nuevo Laredo there is more than one union to compete for worker representation, which has weakened the bargaining position of these labor organizations.

FIGURE 1
Maquiladoras along the U.S.-Mexico Border:1980-1999



Thus, the virtual monopoly of control by a single labor union and union leader makes the Matamoros' maquiladora union the most powerful. The second-ranked group in terms of union power would be that comprised of Reynosa and Nuevo Laredo because of the existing union competition. The lowest-ranked group in terms of union power would include Ciudad Juárez and Tijuana. Not only do these cities have a low union density, but also competition is high among the three major labor confederations—CTM, CROM and CROC. [Williams and Passé-Smith, 1992]. Moreover, unions in these communities might have collective bargaining agreements that prevent them from increasing earnings or they are simply "ghost unions" [Fairris, 2000].

Labor Unions in Tamaulipas: Matamoros, Reynosa and Nuevo Laredo

Because of the strategic economic role that oil production has had in Tamaulipas since the beginning of the 20th century, it is not surprising to find union activity in some of the most important cities of the state, primarily in Tampico where the then private—and mostly foreign—oil companies had settled. Over most of the twentieth century, the state government in Tamaulipas has had a close relationship with labor unions. By the late 1970s, of all the unions affiliated to a national confederation in Tamaulipas, 97.3 percent of the unionized workforce belonged to the Confederación de Trabajadores de México (CTM) and the remaining 2.7 percent of union membership was split between the Confederación Revolucionaria de Obreros y Campesinos (CROC) and the Confederación Regional Obrera Mexicana (CROM).

The strong centralization of union representation in the CTM coupled with pro-labor state governments has allowed the Tamaulipas unions to have power unequaled in any other state. Such strength, however, has not been equal across all cities [Quintero-Ramírez, 1997]. In Reynosa, the maquiladora industry is 100 percent union-

ized and centralized in the CTM; nonetheless, labor leaders have struggled for power for more than twenty years. In Nuevo Laredo, 95 percent of the maquiladora plants are unionized under the CTM, but the leadership has adopted a much more accommodating stance at the time of negotiating collective bargaining agreements [Williams and Passé-Smith, 1992].[4]

In Matamoros, the Sindicato de Jornaleros y Obreros Industriales (SJOI) began in 1932 as a union for cotton industry workers, an important industry in the region until the 1960s. In 1948 the SJOI affiliated with the CTM and, in 1957, Agapito González became its leader and has retained that position since. SJOI union membership substantially fell during the mid-1960s as a result of the demise of the cotton industry. During the same decade, foreign firms began to establish in-bond assembly plants in the region and the focus of union activism shifted from agriculture to manufacturing [Quintero-Ramírez, 1997].

In 1990, because of President Salinas de Gortari's national policy of attracting foreign investment, the CTM created the Sindicato Industrial de Trabajadores de Plantas Maquiladoras (SITPM) in one of the new maquiladoras in an open competition with the SJOI. Nonetheless, even today the level of control exerted by Agapito González's SJOI in Matamoros continues to be highly significant [Quintero-Ramírez, 1997].[5]

Labor Unions in Ciudad Juárez and Tijuana

Union strength is minimal in the maquiladora industry of Tijuana and Ciudad Juárez. Not only are unionization levels low in these cities but also the competition among the major union confederations (CTM, CROM, and CROC) is high. In 1925 the CROM affiliated the main unions in Tijuana. After the Cárdenas administration (1934-40) withdrew its support for the CROM, the CROC, and the CTM experienced increases in union membership during the 1950s and 1960s. By the time maquiladora assembly plants arrived in the 1960s, Tijuana was largely divided in terms of labor representation and was partially unionized.

An aggressive campaign to regain ground by the CROM further splintered labor representation. The CTM and CROC represent traditional unionism in Tijuana while the CROM is characterized by a more conciliatory and non-confrontational stand [Quintero-Ramírez, 1997].

In Juárez, the competition for labor representation between the CROC and CTM has resulted in a reduction in the unionization rate from 33 percent in 1979 to 13 percent in 1990 [Williams and Passé-Smith, 1992].

The above discussion suggests that union strength could not be captured only by the percentage of workers unionized in a given region or plant but also by the degree of union competition and union leadership style. (See Table 1 for a summary of unionization characteristics by city.) A possible way of empirically assessing union strength is by analyzing whether maquiladora employment in the major border cities is characterized by employment queues. The existence of a maquiladora job queue would be a clear indication that unionization strength is substantial. In what follows, we present an empirical model that allows us to assess the differences in union strength across cities.

TABLE 1
Unionization in Maquiladoras

	Union Density	Number of Plants 1997	Plant Size 1997	Main Union Confederation (% of unionized workers)	Union Membership
Matamoros	100%	113	484.3	SJOI (97%) SITPM, CROC & CROM (3%)	Monopolized by Agapito González's SJOI
Reynosa	100%	94	532.9	CTM	Centralized in CTM but characterized by internal strife
Nuevo Laredo	95%	52	380.7	CTM	Centralized in CTM but union considered weak
Cd. Juárez	13%	289	678.5	CROC & CTM	Strong competition among unions
Tijuana	30%	628	215.0	CROM (93%), CTM (4%) & CROC (3%)	CROM is conciliatory CTM and CROC bargain agressively

Otero [1999]; Williams and Passé-Smith [1992]; INIGI: Estadísticas de la Industria Maquiladora de Exportación (www.ineqi.gob.mx)

METHODOLOGY

Abowd and Farber [1982] developed an econometric model that can be adapted to test for the possibility of employment queues in maquiladoras. The model is useful in understanding the factors related to two independent decisions: the decision by an individual to join the queue for employment in a maquiladora, and once he has entered the job queue the decision by the maquiladora to employ the individual.

More formally, assume that an individual's desire to work for a maquiladora is based on a comparison between the benefits and costs of being employed in the maquiladora sector vs. all other alternatives. The queuing propensity function of this decision is given by:

$$Q_i^* = X_i'\beta + \varepsilon_i, \tag{1}$$

where Q_i^* represents a queuing propensity index function for individual i, X_i is a vector of variables determining queuing, β is the related vector of coefficients, and ε_i is the error term. The probability that the ith individual joins the maquiladora employment queue is given by:

$$P(Queue = 1) = P(Q_i^* > 0) = P(\varepsilon_i > -X_i'\beta). \tag{2}$$

From the firm's perspective, the typical maquiladora will select workers that are more likely to minimize labor costs per unit of output, which is in turn related to each individual's characteristics [Lazear, 1998]. The cost per unit of output function C_i^* can then be written as:

$$C_i^* = Z_i'\gamma + \nu_i, \tag{3}$$

where Z_i is a vector of individual characteristics related to employment cost, γ is the vector of coefficients, and ν_i is the error term. Thus, the probability that the ith individual is selected by the firm from the employment queue is given by:

$$P(Hired = 1 \mid Queue = 1) = P(C_i^* > 0) = P(\nu_i > -Z_i'\gamma). \tag{4}$$

By multiplying equations (2) and (4), the probability of obtaining a maquiladora job can then be written as:

$$P(M = 1) = P(Queue = 1)\, P(Hired = 1 \mid Queue = 1) = P(\varepsilon_i > -X_i'\beta)P(\nu_i > -Z_i'\gamma) \tag{5}$$

If we assume that ε_i and ν_i have standard normal distributions and that the queuing and hiring decisions are sequential, the bivariate probit model with partial observability proposed by Abowd and Farber [1982] can be used to estimate the model parameters. These are estimated by maximum likelihood [Poirier, 1980; Meng and Schmidt, 1985].

The queuing propensity function should include as regressors factors typically included in a labor force participation equation such as years of schooling and experience, marital status, household composition, household income and assets and occupation. The employer expected cost per unit of output function should only include factors observable by the employer, and, thus, the specification should exclude household composition, household income, and assets.

Excluding these variables from the cost per unit output function is not only theoretically justified but is also necessary to identify the parameters of the model due to partial observability. That is, we are only able to observe whether individuals are employed in a maquiladora or not, but for non-maquiladora workers, we do not observe whether they had joined the job queue in the first place and were not selected, or whether they had not joined the job queue at all [Poirier, 1980].

To empirically assess whether queuing exists—and the degree of queuing—in maquiladoras, we construct a likelihood ratio test comparing the bivariate probit queuing model with a single probit non-queuing model by city and gender. Rejecting the null hypothesis implies that the bivariate probit model explains the data well and, thus, null rejection would be strong evidence in favor of queuing and, consequently, union strength. We then employ a Wald test of structural differences with unequal variances to see whether queuing differs structurally across cities [Greene, 2000]. Rejecting the null hypothesis implies that the queuing structure in a given city differs from that in a comparison city.

EMPIRICAL RESULTS

To test for the existence of maquiladora employment queuing in the largest border cities, we employ individual level data from the 1998 *Encuesta Nacional de Empleo Urbano* (ENEU; National Urban Employment Survey). The ENEU is a quarterly house-

hold survey conducted by the *Instituto Nacional de Estadística, Geografía e Informática*, Mexico's statistical agency. We employ second quarter data because this is the only quarter that includes home-ownership questions. The survey contains extensive demographic and socioeconomic information from a random sample of the urban population in Mexico [Brown, Pagán and Rodríguez, 1999; Pagán and Tijerina-Guajardo, 2000]. The sample employed includes the border cities of Matamoros, Nuevo Laredo, Ciudad Juárez, and Tijuana, where most maquiladoras are located.[6]

Our working sample consists of those individuals aged 16-65 who reported being employed during the reference (previous) week of the survey. The sample sizes are 2,637 individuals in Matamoros, 2,350 in Nuevo Laredo, 2,427 in Ciudad Juárez, and 2,605 in Tijuana.

Table 2 presents some basic descriptive statistics of the sample by gender, city and sector of employment. Following Brown [1998] and Otero [1999], a worker is defined to be employed in a maquiladora if he or she is employed in a manufacturing sector plant with more than 100 workers.

Gender differences in sectoral participation are substantial across cities. In Matamoros, for example, 48.1 percent of employed men and 27.0 percent of employed women work in maquiladora plants. In Tijuana, however, 34.4 percent of working men and 23.2 percent of working women are employed in maquiladoras.

Note that formal schooling levels tend to be lower in the maquiladora sector than in all other sectors. For women, however, this result does not ensue (except in Tijuana, where schooling levels are about the same for men and women). Potential experience is uniformly higher in non-maquiladora sectors, and this merely reflects the fact that maquiladoras tend to employ relatively younger and less-experienced labor given the nature of in-bond plant production [Carrillo, 1985].

A lower proportion of those working in maquiladoras are married women, but the maquiladora sector tends to employ proportionally more women in managerial and professional jobs. Men employed in maquiladoras also have a higher number of small children living in their households—as well as household members over 12 years of age—when compared to those employed in non-maquiladoras. Home-ownership rates tend to be about the same or higher for individuals in non-maquiladora employment.

Tables 3 to 6 report the empirical results from estimating both simple probit and bivariate probit with partial observability models by city and gender. Before discussing the results, note that the models have a reasonable fit as suggested by Veall and Zimmermann's [1996] pseudo-R^2 measure, which falls within the .17-.47 range.

When one analyzes the results of the probit model for Matamoros, note that men with more schooling are less likely to be employed in maquiladoras but the coefficient on schooling is statistically insignificant for women. The partial observability model, however, shows that while educated men are less likely to queue for a maquiladora jobs, educated women are more likely to queue (but less likely to be selected from the queue).

For both men and women, professionals and managers are more likely to be selected from the queue (although no queuing differences exist across occupation and gender). Another interesting result is that the number of children in the household is

TABLE 2
Sample Means by Gender, City and Sector

Men	Matamoros		Nuevo Laredo		Ciudad Juárez		Tijuana	
Variables	Maq.	Non Maq.	Maq.	Non Maq.	Maq.	Non Maq.	Maq.	Non Maq.
Schooling	8.904	9.475	8.230	9.181	7.228	9.247	8.119	9.410
Experience	14.081	18.297	11.803	19.909	16.108	20.991	14.529	18.750
Experience squared/100	2.827	5.183	1.974	5.927	3.598	6.561	3.153	5.015
Married	0.516	0.495	0.407	0.519	0.554	0.455	0.467	0.499
Professional/Manager	0.254	0.187	0.134	0.169	0.194	0.189	0.213	0.192
Household members under 12	1.134	0.964	1.280	1.125	1.438	0.944	1.154	1.051
Household members over 12	3.380	3.291	4.039	3.549	3.985	3.290	3.916	3.491
Other household income	3.463	3.874	3.651	3.855	3.186	3.354	4.532	4.672
Home owner	0.555	0.559	0.543	0.615	0.521	0.581	0.435	0.576
N	508	548	168	522	426	388	302	577
Women	**Matamoros**		**Nuevo Laredo**		**Ciudad Juárez**		**Tijuana**	
Variables	**Maq.**	**Non Maq.**	**Maq.**	**Non Maq.**	**Maq.**	**Non Maq.**	**Maq.**	**Non Maq.**
Schooling	10.251	8.454	9.045	8.673	8.633	8.160	8.474	8.727
Experience	13.214	21.538	13.612	20.688	15.165	22.085	14.156	20.221
Experience squared/100	2.679	6.353	2.565	6.043	3.173	6.623	3.045	5.676
Married	0.704	0.753	0.647	0.728	0.691	0.759	0.590	0.693
Professional/Manager	0.219	0.140	0.216	0.162	0.271	0.157	0.238	0.151
Household members under 12	1.214	1.228	1.398	1.227	1.392	1.225	1.148	1.239
Household members over 12	3.404	3.333	3.747	3.575	3.562	3.405	3.842	3.397
Other household income	2.917	2.193	2.655	2.162	2.069	1.913	3.791	2.694
Home owner	0.578	0.591	0.513	0.619	0.512	0.602	0.463	0.545
N	429	1,159	298	1362	660	953	401	1325

TABLE 3
Empirical Results: Matamoros

	Probit Model		Partial Observability Bivariate Probit Model			
Men	Pr(M=1)		Pr(Q=1)		Pr(H=1 | Q=1)	
Explanatory Variables	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Constant	1.340	0.238[a]	4.064	0.999[a]	−0.425	0.597
Schooling	−0.131	0.016[a]	−0.260	0.045[a]	0.058	0.066
Experience	−0.007	0.013	−0.017	0.029	0.012	0.027
Experience squared/100	−0.094	0.029[a]	−0.115	0.068[c]	−0.052	0.066
Married	0.097	0.091	−0.484	0.241[b]	0.490	0.211[b]
Professional/Manager	0.691	0.118[a]	0.310	0.317	1.343	0.392[a]
Household members under 12	−0.004	0.039	0.065	0.082		
Household members over 12	0.035	0.030	0.009	0.059		
Other household Income	−0.024	0.011[b]	−0.043	0.018[b]		
Home owner	0.153	0.087[c]	0.180	0.173		
N	1,049		1,049			
Chi squared	148.894		187.933			
Veall and Zimmermann's R^2	0.207		0.262			

TABLE 3 (Cont.)
Empirical Results: Matamoros

Women	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)		Pr(H=1|Q=1)	
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	0.036	0.197	−0.688	1.188	0.740	0.208[a]
Schooling	−0.009	0.012	0.328	0.094[a]	−0.058	0.016[a]
Experience	−0.068	0.012[a]	−0.188	0.094[b]	−0.063	0.013[a]
Experience Squared/100	0.058	0.024[b]	0.629	0.245[b]	0.026	0.026
Married	0.284	0.099[a]	−0.637	0.562	0.369	0.114[a]
Professional/Manager	0.272	0.106[b]	−0.584	0.437	0.475	0.125[a]
Household members under 12	−0.024	0.032	0.185	0.160		
Household members over 12	−0.004	0.027	−0.405	0.147[a]		
Other household income	0.030	0.013[b]	0.895	0.253[a]		
Home owner	0.142	0.076[c]	0.776	0.343[a]		
N		1,588	1,588			
Chi squared	167.963		223.992			
Veall and Zimmermann's R^2	0.202		0.230			

a. Significant at the 99 percent level.
b. Significant at the 95 percent level.
c. Significant at the 90 percent level.

not statistically significant in both models. Other household income decreases the probability of queueing for men but increases it for women.

In Nuevo Laredo, where maquiladora unionization is high, unions are relatively weak and some differences in the model parameters are evident (see Table 4). As in Matamoros, men are less likely to queue for a maquiladora job but in Nuevo Laredo men are also more likely to be hired by a maquiladora once they queue for a job in a plant. Male professionals and managers are also more likely to queue than all other workers.

The results in terms of schooling and occupation are very similar between Nuevo Laredo and Ciudad Juárez—cities with vastly different union densities but both characterized by relatively weak unions when compared to Matamoros. The main difference between these two cities is that in Ciudad Juárez marital status does matter when it comes to queueing and being hired for both men and women (see Table 5). Interestingly, both married men and women are more likely to queue for maquiladora employment than their single counterparts. However, as opposed to women, married men are more likely to be selected from the queue than single men. Thus, firms seem to have a strong preference for hiring single women and married men.

Table 6 reports the results for Tijuana, Baja California. The queuing model for Tijuana does not "fit" the data as well as for other cities as can be ascertained by both the number of statistically significant coefficients as well as the goodness-of-fit measures. Recall that unionization in Tijuana is low and very fractionalized.

The most important result here is that schooling and experience are negatively related to maquiladora employment. Managers and professionals, however, are more likely to queue and be hired from the queue (except men) than all other workers.

TABLE 4
Empirical Results: Nuevo Laredo

Men	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)		Pr(H=1 | Q=1)	
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	1.322	0.345[a]	2.665	0.655[a]	−1.838	1.140
Schooling	−0.154	0.022[a]	−0.269	0.044[a]	0.384	0.135[a]
Experience	−0.033	0.021	−0.054	0.026[b]	0.044	0.090
Experience squared/100	−0.088	0.051[c]	−0.093	0.048[c]	0.032	0.184
Married	0.095	0.134	0.439	0.237[c]	−1.181	0.505[b]
Professional/Manager	0.447	0.194[a]	0.776	0.246[a]	0.230	0.657
Household members under 12	−0.028	0.046	−0.004	0.055		
Household members over 12	0.058	0.039	0.077	0.049		
Other household income	−0.005	0.018	−0.015	0.023		
Home owner	−0.220	0.120[c]	−0.318	0.148[b]		
N	690		690			
Chi squared	132.977		154.578			
Veall and Zimmermann's R^2	0.296		0.348			

Women	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)		Pr(H=1 | Q=1)	
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	−0.043	0.217	0.764	0.892	0.580	0.272[b]
Schooling	−0.066	0.013[a]	0.125	0.053[b]	−0.111	0.020[a]
Experience	−0.011	0.014	−0.170	0.077[b]	0.028	0.019
Experience squared/100	−0.075	0.033[b]	0.378	0.196[c]	−0.168	0.040[a]
Married	0.071	0.105	0.772	0.372[b]	−0.085	0.143
Professional/Manager	0.470	0.119[a]	1.838	1.717	0.370	0.154[b]
Household members under 12	0.026	0.033	−0.018	0.097		
Household members over 12	0.026	0.025	−0.329	0.135[b]		
Other household income	0.020	0.012	0.556	0.174[a]		
Home owner	−0.210	0.079[a]	0.019	0.216		
N	1,660		1,660			
Chi squared	156.283		200.315			
Veall and Zimmermann's R^2	0.168		0.222			

a. Significant at the 99 percent level.
b. Significant at the 95 percent level.
c. Significant at the 90 percent level.

Marital status does not matter for either queueing or being hired. Also, having small children in the household decreases the queuing propensity of women (but not men).

Table 7 reports the results of likelihood ratio tests between the probit and bivariate probit models by gender and city. In Matamoros, Nuevo Laredo, and Ciudad Juárez, we reject the null hypothesis of no queuing at the one percent level of statistical significance. We also reject the no queuing null in Tijuana but only at the five percent level. These results are qualitatively similar for men and women.

TABLE 5
Empirical Results: Ciudad Juárez

Men	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)		Pr(H=1|Q=1)	
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	1.126	0.288[a]	1.713	0.351[a]	−0.048	3.010
Schooling	−0.170	0.018[a]	−0.209	0.022[a]	0.389	0.178[b]
Experience	0.000	0.016	−0.044	0.024[c]	0.064	0.194
Experience squared/100	−0.102	0.033[a]	0.024	0.061	−0.250	0.308
Married	0.364	0.108[a]	0.368	0.126[a]	0.908	0.494[c]
Professional/Manager	1.025	0.164[a]	1.220	0.178[a]	−1.124	0.926
Household members under 12	0.072	0.045	0.089	0.053[c]		
Household members over 12	0.143	0.034[a]	0.152	0.039[a]		
Other household income	−0.028	0.018	−0.029	0.019		
Home owner	−0.121	0.103	−0.158	0.112		
N	814		814			
Chi squared	273.601		303.032			
Veall and Zimmermann's R^2	0.428		0.467			

Women	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)		Pr(H=1|Q=1)	
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	0.664	0.192[a]	1.645	0.506[a]	0.915	0.249[a]
Schooling	−0.063	0.011[a]	−0.111	0.029[a]	−0.023	0.022
Experience	−0.027	0.011[b]	−0.031	0.033	−0.032	0.016[b]
Experience squared/100	−0.028	0.023	0.009	0.087	−0.010	0.030
Married	0.017	0.088	0.699	0.303[b]	−0.376	0.174[b]
Professional/Manager	0.653	0.096[a]	−0.604	0.373	1.481	0.502[a]
Household members under 12	0.019	0.029	0.288	0.112		
Household members over 12	0.071	0.024[a]	0.141	0.068[b]		
Other household income	−0.021	0.016	−0.056	0.024[b]		
Home owner	−0.197	0.069[a]	−0.186	0.167		
N	1,613		1,660			
Chi squared	214.691		244.959			
Veall and Zimmermann's R^2	0.218		0.229			

a. Significant at the 99 percent level.
b. Significant at the 95 percent level.
c. Significant at the 90 percent level.

Based on the magnitude of the likelihood ratio statistics, the results suggest that maquiladora employment is characterized by job queuing. Nonetheless, queuing is stronger in Matamoros than in Ciudad Juárez, Nuevo Laredo, or Tijuana. Moreover, this city ordering is directly related to the degree of union strength in each city as assessed by the number of unions competing for worker representation, the bargaining style of these unions and their leadership.

Table 8 reports the results of Wald tests of structural differences in queuing across cities (assuming 16 degrees of freedom). The results show that the queuing structure

Table 6
Empirical Results: Tijuana

Men	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)			Pr(H=1 | Q=1)
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	1.609	0.276[a]	1.848	0.407[a]	3.290	1.594[b]
Schooling	−0.159	0.018[a]	−0.193	0.029[a]	0.064	0.090
Experience	−0.050	0.015[a]	0.000	0.031	-0.358	0.173[b]
Experience squared/100	0.008	0.032	−0.112	0.066[c]	0.840	0.443[c]
Married	0.058	0.101	−0.099	0.160	0.496	0.353
Professional/Manager	0.662	0.137[a]	0.708	0.221[a]	0.306	0.511
Household members under 12	−0.036	0.039	−0.045	0.050		
Household members over 12	0.110	0.033[a]	0.130	0.043[a]		
Other household income	−0.022	0.013[c]	−0.025	0.015		
Home owner	−0.311	0.095[a]	−0.403	0.117[a]		
N	879		879			
Chi squared	124.348		138.434			
Veall and Zimmermann's R^2	0.237		0.242			

Women	Probit Model Pr(M=1)		Partial Observability Bivariate Probit Model Pr(Q=1)			Pr(H=1 | Q=1)
Explanatory Variables	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**	**Coeff.**	**S.E.**
Constant	0.530	0.195[a]	0.304	0.647	1.557	0.410[a]
Schooling	-0.098	0.012[a]	-0.136	0.044[a]	-0.047	0.029[c]
Experience	-0.052	0.011[a]	0.070	0.050	-0.124	0.028[a]
Experience squared/100	0.022	0.022	-0.152	0.104	0.154	0.053[a]
Married	0.195	0.091[b]	0.467	0.293	-0.059	0.183
Professional/Manager	0.750	0.106[a]	1.024	0.317[a]	0.446	0.211[b]
Household members under 12	-0.078	0.030[a]	-0.124	0.070[c]		
Household members over 12	0.057	0.028[b]	0.099	0.069		
Other household income	0.021	0.012[c]	0.078	0.036[b]		
Home owner	-0.128	0.074[c]	-0.253	0.168		
N	1,726		1,726			
Chi squared	201.676		216.220			
Veall and Zimmermann's R^2	0.187		0.214			

a. Significant at the 99 percent level.
b. Significant at the 95 percent level.
c. Significant at the 90 percent level.

across cities differs when one compares all possible combinations to test intercity differences in coefficients. Thus, not only do we find evidence of queuing but we also find that the queuing structure substantially differs across Mexican border cities.

CONCLUDING REMARKS

This study assesses the impact of qualitative measures of union strength on maquiladoras' employment outcomes. Job queuing is pervasive in the maquiladora

TABLE 7
Likelihood Ratio Queuing Tests

	Matamoros		Nuevo Laredo		Ciudad Juárez		Tijuana	
	LR Stat.	p-value	LR Stat.	p-value	LR Stat.	p-value	LR Stat.	p-value
Men	39.040	0.000	21.602	0.001	29.431	0.000	14.086	0.029
Women	56.029	0.000	44.032	0.000	30.268	0.000	14.545	0.024

TABLE 8
Wald Tests Comparing Queuing Structures across Cities

	Matamoros		Nuevo Laredo		Ciudad Juárez		Tijuana	
Men	Wald Stat.	p-value	Wald Stat.	p-value	Wald Stat.	p-value	Wald Stat.	p-value
Matamoros	___	___	67.838	0.000	33.485	0.006	44.484	0.000
Nuevo Laredo	___	___	___	___	92.471	0.000	55.278	0.000
Ciudad Juárez	___	___	___	___	___	___	52.530	0.000
	Matamoros		**Nuevo Laredo**		**Ciudad Juárez**		**Tijuana**	
Women	Wald Stat.	p-value	Wald Stat.	p-value	Wald Stat.	p-value	Wald Stat.	p-value
Matamoros	___	___	92.351	0.000	183.243	0.000	62.921	0.000
Nuevo Laredo	___	___	___	___	259.524	0.000	96.641	0.000
Ciudad Juárez	___	___	___	___	___	___	109.171	0.000

sector of Matamoros, a city where in-bond assembly plant workers belong to the same union and where union leadership has been centralized in a single union boss for more than 30 years. Although maquiladora employment growth has been slow in Matamoros, wages have risen faster than in any other border city.

The evidence of job queuing, however, is weaker for the cities of Nuevo Laredo, Ciudad Juárez, and Tijuana. These cities are characterized by either high union density but fractionalized union power, or simply minimal union presence. The evidence presented here suggests that unionization rates are not the sole indicators of union power and that other qualitative measures related to the number of unions in a given region and the type of union leadership do matter.

Lastly, although the concentration of union power into a single organization may discourage investment and employment growth in a given region, workers employed by unions in border cities enjoy substantial benefits when compared to those employed in nonunionized settings. Workers in Matamoros' maquiladoras, for example, have enjoyed higher wage levels than workers at any other maquiladora center. In 1984, workers in Matamoros were the first to work under a 40-hour work week with 56 hours of pay [Middlebrook, 1991]. Thus, it could be argued that higher wages and more stable employment for union labor have been achieved at the expense of union democracy and overall employment growth.

NOTES

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1. See, for example, Farber [1990], Freeman [1997] and Hirsch and Macpherson [1998]. In these studies, union membership—and, thus, strength—is measured in terms either of the total number of unionized workers or as the percentage of employed wage and salary workers who belong to unions in a given region, state or demographic group.
2. The "bracero" program began during World War II to alleviate the shortage of agricultural workers in the United States.
3. Unionization percentages are for 1990 as cited by Williams and Passé-Smith [1992]. These figures have not changed substantially during the 1990s [Otero, 1999].
4. Nonetheless, this has not always been the case. During the mid-1970s maquiladora union bosses became known for their militant antibusiness approach. This frightened prospective companies to the point that no new maquiladora plants were established in the city between 1974 and mid-1979 [Williams and Passé-Smith, 1992].
5. According to Mexican labor law, labor disputes, authorization for strikes, complaints by workers, etc., are to be resolved by the *Junta de Conciliación y Arbitraje*. This board includes labor, employer and government representatives. The government, therefore, has the deciding vote. Depending on the political decisions of the governor of the state, the board can take a pro-labor, pro-management, or neutral stance [Williams and Passé-Smith, 1992].
6. A notable exception is Reynosa, Tamaulipas. Unfortunately, this growing border city is not included in the 1998 ENEU.

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